

WHAT IS CLAIMED IS:

1. A method of lyophilizing material, comprising the steps of:
 - 5 placing material to be processed in a chamber under temperature and pressure conditions facilitating lyophilization;
 - 10 creating a microwave field in the chamber;
 - 15 taking temperature measurements in the chamber;
 - 20 controlling microwave power and duration to vary microwave field strength in response to temperature measurements;
- 10 trapping water vapor extracted from the material being dried.
2. A method according to claim 1, wherein the step of trapping water vapor comprises passing the water vapor through a condenser.
- 15 3. A method according to claim 1, wherein the step of trapping water vapor comprises passing the water vapor to or through a desiccant.
- 20 4. A method according to claim 1, comprising the further step of stirring the microwaves in the field to facilitate improved microwave dispersion in the chamber.
5. A method according to claim 1, comprising the further step of shielding selected surfaces in the chamber from direct exposure to microwaves.

6. A method of lyophilizing, comprising the steps of:
placing material in a lyophilizing chamber, the chamber having a controllable
temperature and pressure;
creating chamber conditions to facilitate sublimation;
5 wherein in a first operating mode, the chamber utilizes temperature and pressure
to facilitate sublimation, in a second mode, the chamber utilizes temperature, pressure
and microwaves to facilitate sublimation, and in a third mode utilizes only microwaves to
facilitate sublimation.

10 7. A method according to claim 6, wherein processing includes operation in a
combination of two or more of the first, second and third modes.